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Donald E. Greydanus
Michigan State University

Hatim A. Omar
University of Kentucky, hatim.omar@uky.edu

Artemis Tsitsika
University of Athens, Greece

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Chapter VII

Obesity and Contraception

Donald E. Greydanus[1,*], Hatim A. Omar,[2] and Artemis K. Tsitsika[3]

[1]Pediatrics and Human Development, Michigan State University College of Human Medicine, Michigan State University/Kalamazoo Center for Medical Studies, Kalamazoo, Michigan, United States of America

[2]Adolescent Medicine and Young Parents Program, University of Kentucky, Kentucky Clinic, Lexington, Kentucky, United States of America

[3]Adolescent Health Unit, Second Department of Pediatrics, University of Athens-Greece, Children's Hospital, Athens, Greece

Abstract

All sexually active youth, whether obese or normal weight, should be offered counseling regarding contraception and appropriate contraceptive methods. However, obese youth who are sexually active may be less likely than their normal weight peers to use contraceptives correctly. Methods of contraception for obese adolescents are reviewed in this discussion. Combined oral contraceptives (COCs) and the contraceptive patch have higher failure rates in obese versus normal weight females, though failure rates are lower than noted with barrier contraceptives. The risk for venous thrombosis is higher in obese youth on COCs. Progestin-only pills and the levonorgestrel intrauterine system appear to be safe and effective methods in obese females. Depot-medroxyprogesterone acetate, intravaginal ring, and implants are also considered.

* Correspondence: Professor Donald E Greydanus, MD, Pediatrics and Human Development, Michigan State University College of Human Medicine, Pediatrics Program Director, Michigan State University/Kalamazoo Center for Medical Studies, Kalamazoo, MI 49008-1284 United States. Tel: 269-337-6450; Fax: 269-337-6474; E-mail: Greydanus@kcms.msu.edu

Introduction

Sexually active adolescents whether chronically ill or not, should be offered contraception if they are not willing to accept abstinence [1-7]. Adolescents who are obese are at risk for unwanted pregnancy with its well-known risks and thus, should also be offered safe and effective contraceptives. However, overweight or obese females are less likely to use contraception than their normal weight peers, despite their higher risk for pregnancy-related complications [8]. This chapter reviews contraception in obese youth. In general, contraception is much safer than risks posed because of obesity and pregnancy. Effective methods that the clinician should consider include combined oral contraceptives, mini-pills, depo-medroxyprogesterone aceate, intravaginal ring, implantable contraception, and levonorgestrel intrauterine device (see table 1). Barrier methods are not generally effective in youth.

Combined Oral Contraceptives (COCs)

Females with obesity have some decreased efficacy with COCs due to higher basal metabolic rates, higher hepatic metabolism of enzymes, and drug sequestration that is higher in adipose tissue; however, efficacy is higher than noted with barrier methods [9-13]. There are over 145 brands of combined oral contraceptives (COCs) used throughout the world, which generally contain both synthetic estrogen and synthetic progestin. In the United States, birth control pill brands are various combinations estrogen and progestin. The usual estrogen is ethinyl estradiol as the estrogen, though a few brands use mestranol. Various progestins are used including norgestrel, levonorgestrel, ethynodiol diacetate, norethindrone acetate, norethindrone, desogestrel, norgestimate, norethynodrel, drospirenone, and gestodene (not available in the US). The pill has been shown to be a safe and effective contraceptive for reproductive women – especially for those of the adolescent age group. Thus, motivate adolescent females who are obese can still be encouraged to use the COC despite the reported higher failure rates, mainly because of the overall efficacy of COCs and the known adverse pregnancy outcomes.

Current recommendations are to begin with a monophasic pill, which has 30-35 mcg of estrogen and 0.15 to 1.5 mg of progestin, or a triphasic pill. Triphasic pills are also recommended due to their low dose of estrogen and progestin. Careful monitoring and selection of patients for birth control pill use will reduce complications of the pill to a considerable extent. Contraindications to oral contraception are reviewed in table 2. Sexually active youth who are on combined oral contraceptives are advised to use condoms as well.

Table 1. Contraceptive methods

Abstinence
Combined Oral Contraceptives (COCs)
Contraceptive patch
Mini-pills (Progestin-only pills; POPs)
Emergency contraceptives
Injectable Contraceptives
Depo-Provera® (Depo-medroxy-progesterone acetate
Lunelle® (estradiol cypionate and medroxyprogesterone acetate)
Implants
Norplant I (withdrawn from the US market in 2000)
Implanon (one rod system with etonogestrel)
Jadelle (Norplant II: two silastic rods with levonorgestrel)
Intravaginal ring (NuvaRing)
Intrauterine Devices
Progestasert® IUD (with progesterone)
ParaGard® (Copper T380A IUD)
Mirena® (IUD with levonorgestrel)
Vaginal barrier contraceptives
Cervical cap (Prentif Cavity-rim®)
Condoms (male)
Contraceptive sponge (vaginal)
Diaphragm
Female condom (Reality®)
Spermicides (vaginal)

Ortho Evra Patch

The contraceptive patch provides contraceptive efficacy similar to COCs but may have an increased risk for cardiovascular complications due to delivery of increased hormonal levels in contrast to oral COCs [14]. As noted with the birth control pill, obesity (weight over 90 kg [198 pounds]) leads to reduced contraceptive efficacy, but still levels better than noted with barrier contraceptives [12,13,15,16]. Dermatitis can occur as well with patch technology. Females with a history of skin allergy or exfoliative dermatological disorders may not be good candidates for the patch. There is also an increased incidence in breast symptoms, though most are reported to be mild or moderate [14,17]. Causes of increased risk of contraceptive failure include having the patch on over seven days, patch detachment, and failure to start a new patch after seven days of being off the patch.

Contraindications to OCPs

The World Health Organization has published a list of medical eligibility guidelines to provide clinicians with guidelines for COC use in those with various chronic illnesses that place users at increased risk of complications (see table 2) [18,19]. Those in WHO Category 1 have no restrictions to OCP use, while those in Category 2 present with some increased risk, though the risks of pregnancy exceed them. Category 3 conditions have risks that are further increased, such that the pill is not used unless risks for pregnancy are even higher and no alternative contraceptive is available. Conditions found in Category 4 present risks that are so high that OCPs are not prescribed.

Cardiovascular Complications

Research has indicated an increased risk of cardiovascular complications in females on COCs [7,20,21]. Obese females on birth control pills have an increased risk for pulmonary emboli, thrombophlebitis, and vascular thromboses. Some studies note a greater incidence of myocardial infarction and subarachnoid hemorrhage as well [21]. An absolute OCP contraindication is a past history of venous thrombosis (VT) and the risk of VT is more significant for the adolescent or young adult than arterial thrombosis. Significant obesity is a VT risk factor and the risk is increased in obese COC users [12,13,22].

Cardiovascular deaths from venous and arterial complications in non-smoking females aged 20-24 years is 2-6 per million per year. There is a 3-6 fold increased risk factor for VT development in COC users and the risk for VT is higher with desogestrel versus levonorgestrel [7,20]. The VT risk in the general population is 0.8 per 10,000 women per year, 3-4 for those on COCs, and 6-12 for females who are pregnant or postpartum [20,23,24]. Most who develop venous thrombosis do not have identified VT risk factors. Table 3 lists screening questions to use when considering OCPs for contraception. In general, if there is no overt positive family history for VT, one does not need to screen for factor V Leiden or other prothrombotic mutations.

Table 2. WHO medical eligibility categories for OCPs. Used with permission [3]

Category one (no restrictions)
Antibiotics
Benign breast disease
Benign ovarian tumors
Cervical ectropion
Dysmenorrhea,
Endometriosis
Epilepsy
Family history of breast cancer
Gestational trophoblastic disease (benign or malignant)
Headaches (mild)
History of ectopic pregnancy or abortion (postabortion after first or second trimester),
History of gestational diabetes
Increased STD risk

Iron deficiency anemia
Irregular menstrual bleeding
Obesity
Ovarian or endometrial cancer
Past pelvic surgery
Pelvic inflammatory disease
Postpartum at or over 21 days
Thyroid disorders (as hypo/hyperthyroidism, simple goiter)
Varicose veins
Various infections :malaria, tuberculosis, others)
Sexually transmitted diseases
Viral hepatitis carrier

Category two (caution)

Cervical cancer
Diabetes mellitus (uncomplicated)
Headaches (severe and if they start after beginning OCPs)
Hypertension at 140-159/100-109 mm Hg
Major surgery without prolonged immobilization
Migraine headaches without focal neurologic involvement.
Patients who have a hard time taking the OCP correctly:
    drug or alchohol abuse
    mental retardation
    persistent history as poor OCP takers
    severe psychiatric disorders
Sickle cell disease or sickle C disease
Undiagnosed breast mass

Category three (Usually no OCP given)

Gallbladder disease
Lactating (6 weeks to 6 months),
Less than 21 days postpartum
Medications that interfere with OCP efficacy
Undiagnosed abnormal vaginal/uterine bleeding.

Category four (OCP contraindicated)

Breast cancer
Cerebrovascular accident (active or history)
Complicated structural heart disease (with pulmonary hypertension, atrial fibrillation or history of subacute bacterial endocarditis)
Coronary (or ischemic) heart disease (active or history)
Deep vein thrombosis or pulmonary embolism (active of history)
Diabetes mellitus (complicated with retinopathy, neuropathy, nephropathy)
Headaches (including migraine headaches) with focal neurologic symptoms
Hypertension (severe: (160+/110+ mm Hg or with vascular complications)
Lactation under 6 weeks postpartum
Liver disease (including liver cancer, benign hepatic adenoma, active viral hepatitis, severe cirrhosis)
Pregnancy, complicated
Surgery (involving the lower extremities and/or prolonged immobilization

Table 3. Screening questions about personal/family history of thromboembolism

1.	Is there a history of blood clots in legs or lungs in close family members, including uncles and aunts?
2.	Have any of your close family members been in the hospital for leg/lung blood clots?
3.	Have you and/or close family members ever taking blood thinners?
4.	What were the circumstances that led to blood clot (s), as for example while as a result of traveling by airplane?

The pill should be stopped before situations arise requiring prolonged bed rest as with some surgeries. Hypertension and hyperlipidemia may be complications of obesity. Blood pressure should be regularly checked since it may rise in some patients.25 If there is a family or personal history of hyperlidemia, OCPs may still be prescribed if low-density lipoprotein (LDL)levels remain < 160 mg/dl and triglycerides < 250. COCs are not recommended for adolescents (obese or not) if they have congestive heart failure, cardiac shunts, or low output heart disorders.5,26

Diabetes Mellitus

Diabetes mellitus may be a complication of or occur incidental of obesity. Current evidence suggests that combined oral contraceptives are safe for obese females with well-controlled diabetes mellitus types 1 and 2 [12]. COCs do not worsen the metabolic status in diabetic females [12,13,27]. Care is needed because of concern over worsening metabolic status due to progestins and increased risk for thromboembolic events due to estrogen [28]. COCs should not be offered if they are in poor metabolic control or have hypertension, nephropathy, or retinopathy. Other contraceptive methods that are safe and effective in females with diabetes include progestin-only pills and the intrauterine device (IUD) [13]. There may be an increase in recurrent, treatment-resistant vaginal yeast infections in diabetic youth with an IUD [28]. The use of depo-medroxyprogesterone acetate or levonorgestrel implant may worsen the metabolic status in diabetic females.

Migraine Headaches

Caution is advised when prescribing the birth control pill to an individual with a history of migraine headaches and the COC should be stopped if the migraine aura or headache pattern worsen on COCs [1-4]. If the individual has a history of severe migraines or migraines with prolonged auras (as with the hemiplegic or ophthalmoplegic types) the pill should not be given. If the migraine headache and/or the aura worsen while on the pill, it should be stopped immediately. Careful monitoring is advised when placing women with migraines on the pill. It is not known if obesity presents a greater risk for migraine-related cerebrovascular accidents that may be increased by the COCs or patch.

Other Conditions

Females with active liver disease should not be placed on OCPs. The effect of obesity-related NASH (nonalcoholic steatohepatitis) on COCs not clear at this time. Youth with obesity may be at risk for depression and no obesity-related complications with SSRIs are reported. Tricyclic antidepressants can reduce estrogen levels with increased BTB but not reduced contraceptive efficacy. St. John's wart is used to treat depression and can lead to increased break-through bleeding and anecdotal reports of reduced OC efficacy [1-4]. Some females with obesity are at increased risk for fungal infections and some anti-fungal agents are potent hepatic enzyme inducers with resultant decreased contraceptive efficacy; these agents include griseofulvin, ketoconazole and itraconazole. Other drugs can interfere with contraceptive efficacy, such as rifampin. Table 4 lists management principles for miscellaneous side effects of COCs.

Progestin-only Pills (POPs) (Mini-Pills)

POPs contain 0.35 mg of norethindrone (Micronor®; Nor-Q.D®) and 0.075 mg of norgestrel (Ovrette®). Obesity may be associated with reduced contraceptive efficacy [13]. POPs are typically used in those individuals having disorders where estrogen may be contraindicated – such as sickle cell anemia, cyanotic heart disease, severe hypertension, diabetes mellitus, and others (see table 2). Some clinicians have not recommended the mini-pill for teenagers because of its increased pregnancy rate as well as frequent breakthrough bleeding and amenorrhea noted in some females on the mini-pill [1-4]. POPs are avoided in those with a history of ectopic pregnancy and those taking certain medications (as anticonvulsants, griseofulvin and rifampin). There is no increase in VT in obese females on progestin-only pills [12,13].

Table 4. Management of some oral contraceptive related problems

Problem	Management
Acne	Anti-acne measures and medications
Acute/Chronic monilial vaginitis	Anti-fungal agents (as fluconazole); persistent infections: Look for underlying factors, as diabetes mellitus, other endocrinopathies, use of antibiotics, infected male genital tract, others. Oral nystatin may reduce gastrointestinal reservoir; use anti-fungal agents for a protracted period of treatment.
Breakthrough bleeding	Usually a transient condition; ensure patient is taking the pill each day; higher estrogen pill or supplemental estrogen may help; evaluate for underlying pathology
Suspected pregnancy	COCs are not teratogenic but should be stopped as soon as the pregnancy is identified.
Weight gain or edema	Use a lower estrogen pill

Depot-Medroxyprogesterone Acetate (DMPA)

The main injectable contraceptive available in the US is depomedroxy-progesterone acetate (Depo-Provera®). It is given in a dose of 150 mg intramuscularly every three months and DMPA has a better contraceptive efficacy than the COC with a failure rate of 0.3%. No decreased contraceptive efficacy is noted in obese females versus normal weight females [13]. Its mechanism of action includes an induction of a low FSH/LH level, low LH surge, production of an atrophic endometrium, and thickening of the cervical mucus. Side effects include irregular menses, amenorrhea, acne, breast tenderness, weight gain (with bloating), decrease in bone density, decrease in high-density lipoprotein levels, and some behavioral changes such as irritability and depression.

It is useful where a highly effective contraceptive is needed and where the side effects of an estrogen-type contraceptive must be avoided. Thus, it has been used for individuals with cyanotic heart disease, sickle-cell anemia, thrombophlebitis, and others. Internationally, psychotic and retarded individuals who are at risk for pregnancy have been prescribed this injectable contraceptive. It is considered to be a very effective hormonal contraceptive for obese females, despite the reported change in body composition towards fatness and central redistribution of fat following its use.

Another injectable contraceptive, Lunelle® (5 mg estradiol cypionate and 25 mg medroxyprogesterone acetate [MPA/E2C]), was approved by the FDA in 2000. Estrogen is added to allow a better menstrual period rhythm than seen with Depo-Provera. Less weight gain is noted and overall adverse effects are similar to COCs [29]. Lunelle® is given intramuscularly every 28-30 days and it has a high contraceptive efficacy rate [30]. One study noted that there was a weight gain of 0.9 kg to 1.8 kg if the female weighed under 68 kg versus a weight gain of 1.4 to 3.6 kg if over 68 kilograms [30]. There is no overt contraindication in females with obesity.

Emergency Contraceptives

Emergency contraceptives (EC) are among the most controversial and under prescribed contraceptive methods (seee table 5)[31]. Obesity is not a contraindication to use of ECs. Anti-emetics can be given to prevent the frequent occurrence of nausea and emesis that occurs with high dose estrogen; thus, an antiemetic should be taken an hour before taking these pills. In 1999, the US Food and Drug Administration (FDA) approved of Plan B®, a progestin-only method with two tables of 0.75 mg of levonorgestrel. The first tablet is taken immediately and the second tablet is taken two hours later. Because Plan B® contains no estrogen, nausea and vomiting is uncommon and there is no need to obtain a pregnancy test before administation. Thus, Plan B may be better tolerated than those with estrogen [32]. Though the official recommendation is that they must be used within three days of coitus, they may be effective in pregnancy prevention within five days.

Table 5. Emergency contraceptives

- Ovral® : 2 tablets followed by 2 tables in 12 hours
- Lo/Ovral®, Nordette® or Levlen® : 4 tabs and 4 more in 12 hours
- Plan B®: levonorgestrel, 0.75mg followed by 0.75 mg in 12 hours
- Preven® Emergency Contraceptive Kit
- Ovrette®: 20 tabs and 20 more in 12 hours
- TriPhasil® or Tri-Levlen® (yellow tabs only): 4 tabs, and 4 more in 12 hours

Nuvaring® (Vaginal Ring)

This is a soft, flexible, transparent vaginal ring made of a ethylene vinyl acetate copolymer; it has an outer diameter of 54 mm and a cross-section of 4 mm [2,4]. There are two steroid reservoir cores that provide a daily hormonal release of 15 mcg of ethinyl estradiol and 120 mcg of etonogestrel (an active metabolite of desogestrel) [30,33]. Side effects include extended withdrawal bleeding, vaginal discomfort, nausea, headache, nervousness, acne, breast tenderness, leukorrhea, reduced libido, and slight weight gain. There is an increased risk of thrombotic diseases [34]. There is usually less irregular bleeding than seen with COCs. Extremely overt weight females may have trouble inserting the ring. Obesity itself does not effect the contraceptive efficacy of the NuvaRing and it is considered as one of the most effective hormonal contraceptive methods for obese females.

Implanon®

Norplant® was the first implantable contraceptive developed and was very effective as a contraceptive. It contains six silastic levonorgestrel-containing rods; however, it was withdrawn from the United States market in 2000 [2,4]. The Jadelle® implant (Norplant II) contains two silastic rods with levonorgestrel and Implanon® contains one rod (vinyl ethylene acetate polymer) with etonogestrel [7,35]. Both Jadelle® and Implanon® are approved by the FDA for three years and are not contraindicated in obesity, though both may induce some weight gain. Though obese females have been found to have lower serum etonogestrel levels, there is no reduced efficacy noted with Implanon in obese female [13,36].

Intrauterine Device (IUD)

There are three IUDs which currently are used in the United States: Progestasert IUD®, the ParaGard® (Copper T380A) and the Mirena IUD [2,4,37-39]. Previous controversial IUD links with pelvic inflammatory disease (PID) have limited its application to adolescents. However, the IUD is an excellent contraceptive method with no contraindication in obese women. The Mirena® IUD (Levonorgestrel-containing IUD; LNG-IUD) was FDA-approved in 2001 for five years and contraindications are active PID, prosthetic heart valves, history of

subacute bacterial endocarditis, and distorted uterine cavity. The most common side effect is menstrual bleeding; there is increased bleeding and spotting during the first 3-6 months after insertion that usually decreases after this time. Obese females have an increased incidence of dysfunctional uterine bleeding and endometrial hyperplasia, making the Mirena IUD a good contraceptive choice for obese females needing contraception [12]. No reduced contraceptive efficacy has been noted because of obesity [13,40]. In diabetic patients, an increase in vaginal yeast infections should be taken under consideration.

Conclusions

Contraceptive efficacy is reduced in obese females on the combined oral contraceptive and the contraceptive patch; however, the efficacy is still above that noted with barrier contraceptives. COCs are safe with obese females with diabetes mellitus if they are in good control and do not have nephropathy, retinopathy, neuropathy, or hypertension. Progestin-only pills are safe in obese females but decreased contraceptive efficacy is noted in all females on this contraceptive method. Obesity is not a contraindication to use of depo-medroxyprogesterone acetate, IUD, and intravaginal ring. The mini-pill and levonorgestrel IUD may be the safest for obese females needing contraception [12].

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